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A CRITICAL REVIEW OF SECONDARY DATA ON LEARNING STYLE DIFFERENCES AMONG TEACHER TRAINEES IN HIMACHAL PRADESH ACROSS ACADEMIC STREAMS

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ABSTRACT
The abstract of the study talks about how teacher training might incorporate different learning styles. More and more teachers are understanding that each student learns in their unique way. More and more teacher training programs are understanding how crucial it is to recognize diverse styles while making lesson plans (Simonova, 2011). Learning styles indicate that tailoring teachings to each student's needs will help them do better (Sarabdeen, 2013). There isn't much real-world proof for this "meshing hypothesis" yet (Pashler et al., 2008). The study gives more precise information about how teacher candidates from different academic disciplines in places like Himachal Pradesh learn. The purpose of the study is to find patterns, look at disparities between academic fields, and take into consideration local difficulties by combining available secondary data. The results reveal that most teacher candidates enjoy studying in more than one mode. They also show that certain academic streams may be associated with certain styles, such as visual/analytical for STEM and aural/read-write for humanities. This shows that teacher training programs should not just teach one way of teaching. They should teach a diversity of ways. Future research should focus on primary, localized studies in Himachal Pradesh to find solid proof of effective, Inclusive teaching techniques.

INTRODUCTION

Contextualizing Learning Styles in Teacher Education
More and more, teachers are realizing that each student learns and processes material in their own way. Teacher education programs also show that this understanding is important. Knowing about different learning styles can help future instructors make better lesson plans (Simonova, 2011). Learning styles (Pashler et al., 2008) is the idea that different people like to learn or study in different ways. Advocates say that teachers should find out what these learning styles are and change their lessons to fit them (Pashler et al., 2008). This form of differentiation can improve learning results by matching teaching methods to what students want (Sarabdeen, 2013) (Udhaya Mohan Babu & Kalaiyarasan, 2020). This approach seems like it would work well in education, but it needs solid empirical backing before it can be used (Pashler et al., 2008; Landrum & McDuffie, 2010). Teachers need to know how their students like to learn in order to be able to accommodate a wide range of learning demands in the classroom (Daud et al., 2014).

Statement of Problem and Research Objectives
Even though most teachers agree with learning style theories, there isn't a lot of particular information about how teacher candidates in different academic streams learn differently, especially in places like Himachal Pradesh. This information is only available in secondary sources that the public can access. When there isn't enough complete, consolidated data, it's hard to make changes to teacher education programs that will work best for a variety of learning styles. This review combines all the available secondary data to find trends in the differences in learning styles among teacher candidates. It looks at how these discrepancies might be linked to different academic streams. The purpose is to find similar learning styles, look at how they change within disciplines, and take into consideration elements that are peculiar to Himachal Pradesh.

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Significance and Scope of the Study

To make teacher preparation programs more effective, we need to know how teacher applicants like to study. It is feasible to make curriculum better such that they fit the cognitive and perceptual preferences of future instructors (2014). This could help both keep teachers and improve their teaching. This evaluation looks at secondary data about teacher candidates, using a variety of research findings that look at learning styles in schools. There isn't a lot of direct, specific study on Himachal Pradesh teacher candidates by academic stream in the abstracts that have been given. However, this review will use more general data to look for possible patterns and suggest areas that need more localized research. The scope includes methodological issues from past research, as well as theoretical models and real-world data.

METHODOLOGY

Selection and Evaluation of Secondary Data Sources

This review employed a rigorous strategy to discover and evaluate secondary data sources about academic streams, teacher candidates, and learning styles. As part of the selection process, academic databases and repositories were searched for research articles, reviews, and reports. We looked for studies that employed real-world methods, meta-analyses, or thorough reviews. The keywords we used were "learning styles," "teacher trainees," "pre-service teachers," "academic stream," "disciplinary differences," "pedagogy," and "education." The major criteria for choosing the materials were methodological rigor, application to teacher education, and considerations of variances in learning styles. A secondary data review strategy used abstracts mostly to check if the material was in line with the research goals and relevant (Hammersley, 1993).

Analytical Framework and Thematic Synthesis Approach

The major way to analyze this review was through thematic synthesis. Using this strategy, relevant themes, findings, and arguments were carefully pulled out of the selected secondary data sources. The data was sorted into groups based on common topics, such as popular learning style theories (such VARK and Kolb), disparities within academic fields, and what these variances mean for teaching practice (Sarabdeen, 2013). The synthesis aimed to locate findings that were similar and different, rate the strength of the evidence, and point out gaps in the current literature, especially in relation to the specific situation in Himachal Pradesh. Taking into account things like sample size, measuring equipment, and how well the results can be applied to other situations, we utilized a critical lens to look at the primary studies' methods in the secondary data (Pashler et al., 2008).

LITERATURE REVIEW AND THEMATIC ANALYSIS

Theoretical Foundations of Learning Styles: Models and Taxonomies

The learning styles study is based on many theoretical frameworks that try to group people based on how they like to learn. The VARK (Visual, Aural, Read/Write, Kinesthetic) inventory is a well-known approach that groups preferences based on how they are sensed (Sarabdeen, 2013) (Driscoll & Garcia, n.d.). One of the other taxonomies that focuses on learning as a four-stage cycle is Kolb's Learning Style Inventory. The four stages are active experimentation, abstract conceptualization, reflective observation, and concrete experience (Heffler, 2001). The Dunn and Dunn Learning Style Model (Dan & Larkin, n.d.) shows how environmental, emotional, sociological, physiological, and psychological aspects can affect learning. There is still controversy about whether these models can be used in real-life situations, especially when it comes to the "meshing hypothesis" (Pashler et al., 2008; Landrum & McDuffie, 2010). But knowing about these different ways helps us understand learner attributes better (Li, 2017). Also, studies suggest that people often have more than one learning style, not only one that is the most important (Daud et al., 2014; Alkooheji & Al-Hattami, 2018).

Empirical Evidence on Learning Style Variation Among Teacher Trainees

Research on the learning styles of teacher candidates (Daud et al., 2014) shows that they favor multimodal approaches, which means they may process information in many ways. Aural and kinesthetic preferences are prevalent unimodal choices, while medical students, who are similar to teacher trainees in a professional education setting, often have multimodal learning styles (Daud et al., 2014). Another survey of college students found that majority of them liked multimodal learning the most. Kinesthetic and visual learning modes were the most popular, while Read/Write was the least popular (Alkooheji & Al-Hattami, 2018). These results suggest that teacher preparation programs should use a range of teaching methods to meet the needs of different types of

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learners (Sarabdeen, 2013). As medical training moved from pre-clinical to clinical years, multimodal preferences also grew. This suggests that subject specialization or educational progression may change how people learn (Daud et al., 2014). Learning styles aren't always the same, as shown by the fact that people can change how they learn based on the situation, including the subject (Clark et al., n.d.).

Disciplinary and Academic Stream-Based Differences

There is often a link between a person's academic discipline and their learning style. For example, engineering students have shown a high preference for visual learning and an even split between sequential/global and active/reflective dimensions on the Index of Learning Styles (Ashford et al., 2003). Ashford et al. (2003) say that they likewise preferred the analytic category on the Cognitive Styles Analysis. English Language Learning (ELL) students generally prefer visual learning in addition to auditory and kinesthetic learning (Shanti Manipuspika, 2020) (Wahab & Nuraeni, 2020). This means that the topic matter itself may stimulate certain ways of learning. Teacher candidates' preferred ways of learning may be affected by their academic stream, especially if they are concentrating in diverse areas like physics, the humanities, or math. This is because of the cognitive demands of their specialization.

Socio-Cultural Influences in the Himachal Pradesh Context

Sociocultural influences can have a big impact on how people learn (Valiente, 2008). The secondary sources given don't go into much detail about the learning styles of teacher candidates in Himachal Pradesh by academic stream, but they do give some information from a wider regional perspective. For instance, a study of what teachers in Himachal Pradesh think about training programs found that they are well welcomed, especially when it comes to improving their professional skills and teaching skills (Jishtu, 2020). This suggests that the setting is good for structured learning. Traditional teaching methods in India, which often focus on reading and listening (Shanti Manipuspika, 2020), may have an effect on the prevalence of certain learning styles, such visual and auditory. Cultural emphasis on memorizing, for example, can be a useful learning technique, unlike Western learning theories (Valiente, 2008). When looking at learning style statistics for teacher candidates in Himachal Pradesh, it is very important to understand the local educational culture.

Methodological Issues in Existing Secondary Data Studies

Secondary data reviews are useful, but they also have the same methodological problems as the sources they came from. A big challenge in the field of learning style research is that there aren't any credible experimental designs that can prove that learning styles can be used in the classroom (Pashler et al., 2008). Many studies employ self-reported preferences, although these may not necessarily be accurate indicators of how well someone is learning (Pashler et al., 2008). There isn't much scientific evidence for the "meshing hypothesis," which says that instruction should match preferred learning styles for the best learning outcomes. This is despite the fact that many people believe in learning styles (Pashler et al., 2008; Landrum & McDuffie, 2010; Lawrence et al., 2020). There are a lot of research, especially in higher education, that support learning styles in some way or another. This gives the mistaken impression that there is a lot of empirical support for them (Newton, 2015). This difference between belief and evidence makes it harder to understand secondary data.

Sampling, Measurement, and Data Interpretation Challenges

Secondary data has problems since original studies employ different ways to sample and measure. Sample sizes for learning style studies might be as little as 24 English Department students (Wahab & Nuraeni, 2020) or as high as 106 or 185 university students (Sarabdeen, 2013) (Alkooheji & Al-Hattami, 2018). Results from certain groups, such engineering students (Ashford et al., 2003) or medical students (Daud et al., 2014), don't necessarily apply to teacher candidates in Himachal Pradesh. The different assessment tools (such VARK, Kolb LSI, and Felder & Soloman ILS) also make it harder to compare studies directly and combine their results (Sarabdeen, 2013; Ashford et al., 2003; Iftode, 2019). The false idea that teachers can accurately judge how pupils learn also affects how data is understood (Papadatou-Pastou et al., 2018). Because of these things, it's important to be careful when drawing strong conclusions from secondary data that has been acquired.

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ANALYSIS AND DISCUSSION

Patterns of Learning Style Differences by Academic Stream

There isn't any direct research on teacher candidates in Himachal Pradesh in the sources cited, but secondary data analysis suggests that learning style preferences do differ and can be linked to academic streams. Most of the time, students who study courses that require a specific level of mental involvement tend to prefer certain ways of learning. For instance, engineering students generally want to learn through analysis and visuals (Ashford et al., 2003). Teacher candidates who want to teach science or math may also like visual aids, hands-on experiments, and logical problem-solving because of the nature of their subjects. On the other hand, students in language or humanities degrees may be more likely to prefer listening or reading and writing modes, which makes sense given how they interact with spoken and written language (Shanti Manipuspika, 2020). Different groups of students consistently use multimodal learning (Daud et al., 2014; Alkooheji & Al-Hattami, 2018). This means that teacher candidates from any academic subject will probably benefit from teaching methods that use a mix of sensory and cognitive approaches. The pre-service teacher education setting suggests that teachers should be able to adapt their teaching techniques to meet the needs of different students. The fact that learning styles can change based on the subject matter or degree of schooling (Clark et al., n.d.; Daud et al., 2014) also supports the idea that teacher training programs should include a variety of teaching methods. There isn't any specific quantitative data for Himachal Pradesh, but the general trends seen around the world suggest that the academic stream will undoubtedly affect the range of learning styles among teacher candidates in the state.

Implications for Teacher Training Curriculum Design

Recognizing that teacher candidates have different learning styles suggests a number of things to think about while designing a curriculum. To allow for a wider range of teaching methods, training programs should stop using a single, traditional lecture style, which often goes together with auditory and read/write styles (Agustrianita et al., 2019). Adding kinesthetic activities, visual presentations, and group work can help a larger spectrum of learners, including those who prefer more than one mode of learning (Sarabdeen, 2013) (Driscoll & Garcia, n.d.). For example, it has been shown that resource people who use computers and PowerPoint presentations in training programs are effective (Jishtu, 2020), which shows how important it is to have interactive and visual aspects. Also, giving teacher candidates the tools to understand how they learn best will help them choose the best ways to study and become more effective in their jobs (Jishtu, 2020) (Udhaya Mohan Babu & Kalaiyarasan, 2020). Curriculum designers could want to integrate modules on adaptive pedagogy (Agustrianita et al., 2019) to help future teachers learn how to recognize and meet the different learning needs of their pupils. This goes beyond just changing lessons to fit students' learning styles (Pashler et al., 2008) because there isn't much support for the "meshing hypothesis." Instead, the focus should be on using a range of teaching methods that provide each student several ways to understand (Whyte, 2017). This strategy can help teacher candidates make K–12 and other learning environments more welcoming and productive (2012).

Equity, Inclusivity, and Policy Considerations in Learning Styles Research

The argument about learning styles is about more than just that; it's also about fairness and inclusion in education. Making curriculum that take into account varied learning styles can make the classroom a fairer place to learn, especially for students who might not do well with typical, traditional teaching methods (Zywno, n.d.). This is especially significant in places like Himachal Pradesh that have a lot of different cultures, where students' sociocultural origins may affect how they learn (Valiente, 2008). Policies that support teacher education should encourage training institutions to use flexible teaching methods and give teacher candidates the skills they need to teach in multiple ways (Peiser, n.d.) (Tatto et al., 2016). But there also needs to be proof that the policy works. Learning styles are an interesting idea, but policies should be careful about making changes based purely on unproven hypotheses like the "meshing hypothesis" (Pashler et al., 2008). Instead, the focus should be on good teaching methods that help all students, such as presenting knowledge in different ways, getting students involved, and giving clear instructions (Khan, 2019). Teacher training programs in Himachal Pradesh and other places can include inclusive education training to help future teachers meet the needs of all kinds of pupils, including those with disabilities (Anthony & Yasin, 2019). Policies should encourage teachers' continued professional development so they can learn more and teach better (Jishtu, 2020). This will help make sure that education is of good quality.

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Limitations of Secondary Data Approaches and Areas for Further Inquiry It is not a good idea to rely only on secondary data, especially when looking at specific academic and geographical streams for teacher candidates in Himachal Pradesh. There isn't enough primary research that looks at this demography and breakdown directly, therefore we have to combine larger, often unrelated studies to come to conclusions. This makes it harder to apply the results directly and to be specific. Many research on learning styles utilize self-reported questionnaires, however they may not correctly show how people really learn or how well they learn (Pashler et al., 2008) (Alkooheji & Al-Hattami, 2018). Also, it's hard to compare research directly because they utilize various theories and ways to assess things (Ashford et al., 2003). Because learning can be affected by social and cultural factors, it is also vital to think carefully about whether results from other places or cultures can be used in Himachal Pradesh (Valiente, 2008). In order to directly compare the differences in learning styles among teacher candidates from different academic streams, future study should focus on primary studies done in Himachal Pradesh. This kind of research could use mixed-methods approaches, which combine qualitative information about how learning styles affect the setting and how they can be used in real life with quantitative assessments of learning styles. Longitudinal studies could also keep track of how learning styles change over time as teachers prepare to teach and then teach (Clark et al., n.d.). Research could also look into how well certain teaching methods work for different types of learners in teacher education settings. This would give teachers more concrete evidence for their suggestions (Chen et al., 2005) (2012).

CONCLUSION

Synthesis of Key Findings and Theoretical Contributions

Using secondary data, this review demonstrates that learning styles are a well-known part of individual differences in education. Theoretical models like VARK and Kolb help us comprehend them (Sarabdeen, 2013) (Heffler, 2001). It has been found that many different types of students, including those in professional training, like to study in more than one way (Daud et al., 2014) (Alkooheji & Al-Hattami, 2018). The secondary sources we looked at didn't have any direct, specific information about teacher trainees in Himachal Pradesh by academic stream. However, general trends from related fields suggest that academic specialization can be linked to preferred learning styles. For example, in STEM-related fields, visual and analytical styles are common, while in the humanities, aural/read-write styles are common (Ashford et al., 2003; Shanti Manipuspika, 2020). The fact that learning styles change based on the subject and level of education is a big theoretical contribution (Clark et al., n.d.). However, the most important difference is between preferred learning styles and the fact that there isn't much strong evidence to support the idea that customizing instruction to these styles works (Pashler et al., 2008).

Recommendations for Practice, Policy, and Future Research Directions

For educational practice, schools that train teachers should use a variety of teaching styles, such as visual, auditory, kinesthetic, and reading/writing, to meet the needs of multimodal learners and get future instructors ready for different types of classrooms (Sarabdeen, 2013). This means using technology to help with learning, giving students chances to learn by doing, and making learning more interactive (Jishtu, 2020; Chen et al., 2005). For policy, people in charge in Himachal Pradesh should promote research projects that map the diverse learning styles of teacher trainees in the region's different academic streams. Policies should support teacher education programs to include adaptive teaching practices so that future teachers are ready to meet the requirements of all kinds of students. At the same time, policies should not be based on unproven theories of learning styles (Landrum & McDuffie, 2010). Future study should focus on primary, methodologically sound studies in Himachal Pradesh to fill in the gaps in the current data. These studies should use experimental designs to find out how different teaching approaches affect the learning results of diverse groups of students with different learning styles. They should go beyond just finding out what people like and really test how well the methods work. Looking into how social and cultural factors affect learning styles in the area would also be helpful (Valiente, 2008).

REFERENCES

1) Simonova, I. (2011). Learning Styles in Foreign Language Teaching/Learning. In *International Journal of Engineering Pedagogy (iJEP)* (Vol. 1, Issue 1, p. 8). International Association of Online Engineering (IAOE). https://doi.org/10.3991/ijep.v1i1.1587
2) 2.Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning Styles. In *Psychological Science in the Public Interest* (Vol. 9, Issue 3, pp. 105–119). SAGE Publications. https://doi.org/10.1111/j.1539-6053.2009.01038.x

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(IJETRM)
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3) 3.Sarabdeen, J. (2013). Learning Styles and Training Methods. In *Communications of the IBIMA* (pp. 1–9). IBIMA Publishing. https://doi.org/10.5171/2013.311167
4) 4.Udhaya Mohan Babu, R., & Kalaiyarasan, G. (2020). A Study on Learning Style of Higher Secondary School Students. In *Shanlax International Journal of Education* (Vol. 9, Issue 1, pp. 163–168). Shanlax International Journals. https://doi.org/10.34293/education.v9i1.3389
5) 5.Landrum, T. J., & McDuffie, K. A. (2010). Learning Styles in the Age of Differentiated Instruction. In *Exceptionality* (Vol. 18, Issue 1, pp. 6–17). Informa UK Limited. https://doi.org/10.1080/09362830903462441
6) 6.Daud, S., Kashif, R., & Chaudhry, A. M. (2014). Learning styles of medical students. In *South-East Asian Journal of Medical Education* (Vol. 8, Issue 1, p. 40). Sri Lanka Journals Online (JOL). https://doi.org/10.4038/seajme.v8i1.123
7) 7.Hammersley, M. (1993). On the Teacher as Researcher. In *Educational Action Research* (Vol. 1, Issue 3, pp. 425–445). Informa UK Limited. https://doi.org/10.1080/0965079930010308
8) 8.Driscoll, S. A., & Garcia, C. E. (n.d.). Profiling Preferred Learning Styles For Engineering Students. In *2000 Annual Conference Proceedings* (p. 5.504.1-5.504.10). ASEE Conferences. https://doi.org/10.18260/1-2--8639
9) 9.Heffler, B. (2001). Individual Learning Style and the Learning Style Inventory. In *Educational Studies* (Vol. 27, Issue 3, pp. 307–316). Informa UK Limited. https://doi.org/10.1080/03055690120076583
10) 10.Dan, B., & Larkin, T. (n.d.). Learning Styles In The Physics Classroom: A Research Informed Approach. In *2003 Annual Conference Proceedings* (p. 8.815.1-8.815.14). ASEE Conferences. https://doi.org/10.18260/1-2--12374
11) 11.Li, Y.-D. (2017). The Research and Summaries about Some Questions of Learning Style. In *Proceedings of the 2017 2nd International Conference on Humanities and Social Science (HSS 2017)*. Atlantis Press. https://doi.org/10.2991/hss-17.2017.23
12) 12.Alkooheji, L., & Al-Hattami, A. (2018). Learning Style Preferences among College Students. In *International Education Studies* (Vol. 11, Issue 10, p. 50). Canadian Center of Science and Education. https://doi.org/10.5539/ies.v11n10p50
13) 13.Clark, Q., Mohler, J., & Magana, A. (n.d.). Learning Style Dynamics. In *2015 ASEE Annual Conference and Exposition Proceedings* (p. 26.1076.1-26.1076.23). ASEE Conferences. https://doi.org/10.18260/p.24413
14) 14.Ashford, T. S., Shehab, R. L., Rhoads, T. R., & Court, M. C. (2003). A Survey of Learning Styles of Engineering Students. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 47, Issue 6, pp. 870–874). SAGE Publications. https://doi.org/10.1177/154193120304700607
15) 15.Shanti Manipuspika, Y. (2020). Learning Styles of Indonesian EFL Students: Culture and Learning. In *Arab World English Journal* (Vol. 11, Issue 1, pp. 91–102). AWEJ Group. https://doi.org/10.24093/awej/vol11no1.8
16) 16.Wahab, I., & Nuraeni, N. (2020). THE ANALYSIS OF STUDENTS' LEARNING STYLE. In *SELTICS* (Vol. 3, Issue 1, pp. 41–46). Universitas Muslim Maros. https://doi.org/10.46918/seltics.v3i1.509
17) 17.Valiente, C. (2008). Are students using the "wrong" style of learning? In *Active Learning in Higher Education* (Vol. 9, Issue 1, pp. 73–91). SAGE Publications. https://doi.org/10.1177/1469787407086746
18) 18.Jishtu, P. (2020). Perception of In-service Teacher Trainees' Towards Training Programmes in Selected Districts of Himachal Pradesh. In *INTERNATIONAL JOURNAL OF EDUCATIONAL SCIENCES* (Vol. 28, Issues 1–3). Kamla Raj Enterprises. https://doi.org/10.31901/24566322.2020/28.1-3.1122
19) 19.Lawrence, B. C., Ntelioglou, B. Y., & Milford, T. (2020). It Is Complicated: Learning and Teaching Is Not About "Learning Styles." In *Frontiers for Young Minds* (Vol. 8). Frontiers Media SA. https://doi.org/10.3389/frym.2020.00110
20) 20.Newton, P. M. (2015). The Learning Styles Myth is Thriving in Higher Education. In *Frontiers in Psychology* (Vol. 6). Frontiers Media SA. https://doi.org/10.3389/fpsyg.2015.01908
21) 21.Iftode, D. (2019). Generation Z and Learning Styles. In *SSRN Electronic Journal*. Elsevier BV. https://doi.org/10.2139/ssrn.3518722

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International Journal of Engineering Technology Research & Management
(IJETRM)
https://ijetrm.com/

22) 22.Papadatou-Pastou, M., Gritzali, M., & Barrable, A. (2018). The Learning Styles Educational Neuromyth: Lack of Agreement Between Teachers' Judgments, Self-Assessment, and Students' Intelligence. In *Frontiers in Education* (Vol. 3). Frontiers Media SA. https://doi.org/10.3389/feduc.2018.00105
23) 23.Agustrianita, A., Suherdi, D., & Purnawarman, P. (2019). Teachers' Perception on Students' Learning Style and Their Teaching. In *Indonesian Journal of Curriculum and Educational Technology Studies* (Vol. 7, Issue 1, pp. 11–19). Universitas Negeri Semarang. https://doi.org/10.15294/ijcets.v7i1.26727
24) 24.Whyte, B. (2017). Learner-centred teaching style: perceptions and practices of teachers. In *Waikato Journal of Education* (Vol. 1, Issue 1). University of Waikato. https://doi.org/10.15663/wje.v1i1.529
25) 25.(2012). LEARNING STYLES FOR K-12 MATHEMATICS E-LEARNING. In *Proceedings of the 4th International Conference on Computer Supported Education* (pp. 317–322). SciTePress - Science and and Technology Publications. https://doi.org/10.5220/0003916603170322
26) 26.Zywno, M. (n.d.). Instructional Technology, Learning Styles, And Academic Achievement. In *2002 Annual Conference Proceedings* (p. 7.677.1-7.677.24). ASEE Conferences. https://doi.org/10.18260/1-2--11029
27) 27.Peiser, G. (n.d.). The place of research in teacher education. In *Teacher education in times of change* (1st ed., pp. 161–178). Bristol University Press. https://doi.org/10.2307/j.ctt1t89fvx.15
28) 28.Tatto, M. T., Richmond, G., & Carter Andrews, D. J. (2016). The Research We Need in Teacher Education. In *Journal of Teacher Education* (Vol. 67, Issue 4, pp. 247–250). SAGE Publications. https://doi.org/10.1177/0022487116663694
29) 29.Khan, F. A. (2019). Learning to teach. In *Science* (Vol. 366, Issue 6472, pp. 1574–1574). American Association for the Advancement of Science (AAAS). https://doi.org/10.1126/science.366.6472.1574
30) 30.Anthony, N., & Yasin, M. H. M. (2019). Trainee Teachers Level of Willingness for Inclusive Education. In *Journal of ICSAR* (Vol. 3, Issue 1, pp. 79–83). State University of Malang (UM). https://doi.org/10.17977/um005v3i12019p079
31) 31. Chen, C. J., Toh, S. C., & Ismail, W. M. F. W. (2005). Are Learning Styles Relevant To Virtual Reality? In *Journal of Research on Technology in Education* (Vol. 38, Issue 2, pp. 123–141). Informa UK Limited. https://doi.org/10.1080/15391523.2005.10782453